

In the Claims

Claims 1-84 (Canceled)

85. (Currently amended) The construct of claim 96 ~~84~~ wherein the chondrocytes are activated with the ~~cyclic or constant~~ or cyclic hydrostatic pressure of about 3.0 MPA, applied, for the cyclic hydrostatic pressure, at a frequency of about 0.5 Hz, and wherein both the cyclic and constant hydrostatic pressure are applied for about 7 to about 14 days, followed by the resting period of about 7 days to about 28 days, under perfusion flow rate between 5 μ L and 50 μ L/minute and under oxygen concentration of between 2% and 5%.

86. (Previously presented) The construct of claim 85 wherein said collagenous support matrix is prepared from Type I collagen or Type II collagen.

87. (Currently amended) The construct of claim 85 wherein said support matrix is a sponge or honeycomb ~~[[like]]~~ lattice containing a plurality of pores dividing the space into a fluidically connected interstitial network.

88. (Previously presented) The construct of claim 87 wherein chondrocytes are seeded in the support matrix at a cell density between about 12 and 15 millions.

89. (Previously presented) The construct of claim 85 wherein said chondrocytes are activated under the perfusion flow rate from about 1 to about 50 μ L per minute.

90. (Previously presented) The construct of claim 85 wherein said chondrocytes are activated at an oxygen concentration of about 2%.

91. (Currently amended) The construct of claim 85 wherein said tissue processor is a Tissue Engineering Support System (TESS™) culture unit comprising at least a culture unit for culturing chondrocytes seeded in said matrix, a supply unit for supplying a culture medium to the culture unit and the pressure generator for applying the constant or cyclic pressure to chondrocytes.

92. (Previously presented) The construct of claim 85 wherein said chondrocytes are activated with a cyclic or hydrostatic pressure of about 0.5 MPa.

93. (Previously presented) The construct of claim 85 wherein said chondrocytes are activated at the perfusion rate of about 5 μ l/min.

94. (Previously presented) The construct of claim 85 wherein said chondrocytes are activated at about 5% concentration of carbon dioxide.

95. (Previously presented) The construct of claim 85 implanted into a cartilage lesion.

96. (New) An implantable hyaline cartilage construct prepared by a process comprising steps:

preparing a collagenous porous support matrix having pores between 100 and 300 μm ,

seeding said support matrix with isolated expanded mammalian chondrocytes that are in a static non-dividing stage;

subjecting said matrix seeded with said chondrocytes to activation to an active stage wherein said activated chondrocytes divide, multiply and promote growth of an extracellular matrix, said activation performed in a tissue processor and comprising treating said matrix seeded with said chondrocytes to a cyclic or constant hydrostatic pressure between about 0.5 MPA and 5 MPA above atmospheric pressure, wherein for the cyclic hydrostatic pressure, such pressure is applied at a frequency between 0.01 Hz and 2.0 Hz, wherein the cyclic or static hydrostatic pressure is applied for about 1 hour to about 30 days, followed by a resting period of about 1 day to about 60 days, under perfusion with a perfusion medium at a rate of perfusion flow between 1 μL and 500 $\mu\text{L}/\text{minute}$ and under oxygen concentration between 1% and 20%,

wherein the tissue processor comprises at least a pressure generator for applying a constant or cyclic hydrostatic pressure,

wherein following said treatment, said activated chondrocytes are in an active stage where they divide, multiply and promote growth of the extracellular matrix by producing sulfated glycosaminoglycan (S-GAG) and DNA, wherein production of S-GAG by said activated chondrocytes is increased to at least

152% compared to chondrocytes not subjected to said activation and wherein a DNA content index, determined by Hoechst Dye DNA assay, is increased by said activated chondrocytes to the DNA content index 1.49 compared to that of the DNA content index 1 observed in chondrocytes not subjected to said activation.